Geophysical Research Abstracts
Vol. 18, EGU2016-6686, 2016
EGU General Assembly 2016

The carbon functional group budget of a peatland

Catherine Moody (1), Fred Worrall (1), Gareth Clay (2), and David Apperley (3)

(1) University of Durham, Earth Science, Durham, United Kingdom (c.s.moody@durham.ac.uk), (2) University of Manchester, School of Environment, Education and Development, Manchester, United Kingdom, (3) University of Durham, Chemistry Department, Durham, UK

Organic matter samples were taken from each organic matter reservoir and fluvial flux found in a peatland and analysed by elemental analysis for carbon, hydrogen, nitrogen and oxygen content, and by 13C solid state nuclear magnetic resonance (NMR) for functional group composition. The samples analysed were: aboveground, belowground, heather, mosses and sedges, litter layer, four different depths from a peat core, and monthly samples of fluvial particulate and dissolved organic matter. All organic matter samples were taken from a 100% peat catchment within Moor House National Nature Reserve in the North Pennines, UK.

The proportion of carbon atoms from each of the eight carbon functional groups (C-alkyl, N-alkyl/methoxyl C, O-alkyl, O_2-alkyl/acetal C, aromatic/unsaturated C, phenolic C, aldehyde/ketone C and amide/carboxyl C) from each type of organic matter were combined with an existing carbon budget from the same site, to give a functional group carbon budget. The budget results show that the ecosystem is accumulating N-alkyl/methoxyl C, O-alkyl, O_2-alkyl/acetal C and phenolic C groups, but losing C-alkyl, aromatic/unsaturated C, amide/carboxyl C and aldehyde/ketone C. Comparing the functional group compositions between the sampled organic matter pools shows that DOM arises from two distinct sources; from the peat itself and from a vegetation source.